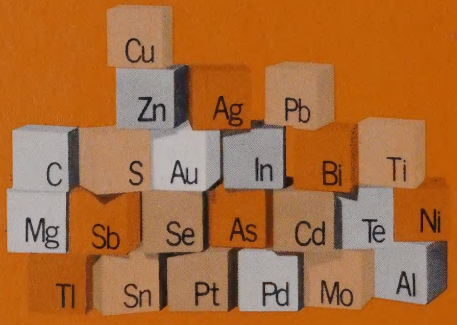
AMERICAN SMELTING AND REFINING COMPANY • 1970 ANNUAL REPORT

American Smelting and Refining Company produces a wide range of metals and minerals for industry as represented by the building-block form which has become the symbol of Asarco's diversity, capability and quality. The chemical symbols shown in the blocks are:



Cu	Copper	Se	Sellenium
Zn	Zinc	As	Arsenic
Ag	Silver	Cd	Cadmium
Pb	Lead	Te	Tellurium
C	Carbon	Ni	Nickel
S	Sulfur	Tl	Thallium
Au	Gold	Sn	Tin
In	Indium	Pt	Platinum
Bi	Bismuth	Pd	Palladium
Ti	Titanium	Mo	Molybdenum
Mg	Magnesium	Al	Aluminum
Sb	Antimony	*	Asbestos

*Chrysotile asbestos, produced by Asarco, is a complex mineral represented by the formula $3MgO \cdot 2SiO_2 \cdot 2H_2O$.

The cube on the covers of Asarco's 1970 Annual Report illustrates six of the principal functions performed in recovering these metals and minerals and making them available to industry. Illustrated on the front cover are mining (aerial view of the Mission mine and mill in Arizona), smelting (pouring slag at the El Paso, Texas plant) and refining (stripping zinc from cathodes at the Corpus Christi, Texas plant).

Illustrated on the back cover are research (laboratory at Asarco's South Plainfield, New Jersey Central Research Laboratories), exploration (view of a diamond drill on location) and recycling (solder bars containing lead reclaimed from scrap by Federated Metals Division).

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General Offices
120 Broadway
New York, N. Y. 10005

Registrar of Stock
The Chase Manhattan Bank, N.A.
1 Chase Manhattan Plaza
New York, N. Y. 10015

Corporate Office
15 Exchange Place
Jersey City, N. J. 07302

Transfer Office
120 Broadway
New York, N. Y. 10005

HIGHLIGHTS

For the year:	1970	Per Share*	1969	Per Share*
Earnings before extraordinary items	$ 88,803,000	$3.16	$ 99,394,000	$3.42
Extraordinary items, net of income tax	22,915,000	.81	1,414,000	.05
Net earnings	$111,718,000	$3.97	$100,808,000	$3.47
Dividends paid	$ 53,893,000	$1.90	$ 55,224,000	$1.90
Exploration and research expenses	12,578,000		9,363,000	
Capital expenditures	68,723,000		25,048,000	
Depreciation and depletion	15,223,000		15,236,000	
At year end:				
Working capital	$191,713,000		$204,859,000	
Shares outstanding	26,744,925		28,934,909	
Stockholders	50,900		38,300	
Employees	14,100		13,400	
*Earnings per share based on average number of shares outstanding each year	28,156,657		29,058,803	

To Asarco Stockholders:

Exclusive of extraordinary items, net earnings for 1970 were $88,803,000 or $3.16 per share, compared to $99,394,000 or $3.42 per share in 1969. The sale of 2,028,000 shares of General Cable Corporation stock in 1970 resulted in an extraordinary gain of $31,545,000 which was partially offset by write-offs of $4,686,000 because of the cancellation of the Michiquillay concessions in Peru, and $3,944,000 because of closing of the Selby, California lead smelter and refinery, all net of income tax.

The strong market trends for all of our metals which characterized the last several years continued for the first half of 1970. Thereafter world-wide demand began to weaken, and, as deliveries to consumers declined, producer stocks increased, putting pressure on prices. At the end of the year, the quoted prices for most of the metals that we produce were lower than at the beginning.

Meanwhile, increases in operating costs which are plaguing a large segment of U. S. industry continued, further depressing profit margins, particularly at the domestic smelters and refineries.

During the year, your management's efforts to strengthen Asarco's basic position in production of materials essential to our industrial society continued unabated. Asarco's expenditures for exploration and research totaled $13,093,000—a substantial increase over past years. Four operating coal mines were acquired in Illinois, and plans materialized for the development of an ilmenite deposit near Lakehurst, New Jersey that was discovered by Asarco geologists in 1957. The Granduc copper mine in British Columbia, in which Asarco has a fifty percent interest, began operations in November and will achieve designed capacity in 1971. Asarco's investment in this property totals about $62 million. The mine is operated by a subsidiary of Newmont Mining Corporation.

Mill construction and mine development continued at two smaller lead-zinc mines, one near Leadville, Colorado and the other in Nicaragua. Both should begin operations in 1971.

Historically, the lead, zinc and copper smelters of the world have discharged the sulfur present in the materials processed to the atmosphere in the form of sulfur-dioxide gas. Part of this sulfur has been recovered as sulfuric acid or liquid sulfur dioxide where recovery was feasible and the sulfur by-products could be disposed of. The rest entered the atmos-

phere through smoke stacks tall enough to assure sufficient dispersion to maintain a satisfactory ground level air quality.

In 1970, however, prompted by nationwide concern for the environment, the prevailing ambient air standards came under review. More stringent ambient air standards were imposed and, in addition, following recommendations of the National Air Pollution Control Administration, a number of states adopted an entirely new approach which requires elimination of 90 percent of the sulfur contained in materials processed prior to the emission of stack gases to the atmosphere.

Asarco is committed to a positive program of air-quality control. But, like all business, Asarco must operate within limits which are technically feasible and economically tolerable on a plant-by-plant basis. In 1970, the Company's capital expenditures for air-pollution control facilities totaled nearly $13 million. Larger expenditures are in prospect. A sulfuric-acid plant will be completed at the Hayden copper smelter this spring and a similar plant will be constructed at El Paso. These two plants will cost about $35 million and will capture more than 50 percent of the sulfur contained in materials processed at these operations.

The cost of further sulfur dioxide control will be very high and no significant estimates yet can be made. New methods will be required—either development of an economic process for the production of elemental sulfur from stack gases or alternative means of capturing and disposing of by-products or waste products containing sulfur.

Looking abroad, Mount Isa had a very good year, the most dynamic in its history. The 17,600 ton per day target of its ten-year expansion program completed in 1969 was comfortably realized. Net earnings totaled $62,072,000 (U.S.) in the fiscal year ended June 28, 1970, almost double earnings in fiscal 1969. As a result of a substantial increase in copper ore reserves, copper production capacity will be expanded to 170,000 tons per year. Development continued at the new Hilton mine, 12 miles north of Mount Isa. Lead-silver-zinc ore reserves at the Hilton mine were increased during the year.

To provide a more flexible structure for future growth, Mount Isa Mines Limited was reorganized in October 1970 as a holding company with a number of operating subsidiaries. The new holding company, in which Asarco retains a 52.7-percent interest, is known as M.I.M. Holdings Limited.

Operations at the Toquepala mine of Southern Peru Copper Corporation, 51.5-percent-owned by Asarco, were satisfactory, resulting in an increased tonnage of ore treated and increased copper production. Work continued on Southern Peru's Cuajone property where the schedule which calls for development of the mine in 6½ years was met. Asarco's Quiruvilca mine in northern Peru operated at a satisfactory level.

During the year, Asarco's undeveloped Michiquillay property in northern Peru and, in January 1971, Southern Peru's undeveloped Quellaveco property near the Cuajone deposit were taken over by the Peruvian Government under new decrees promulgated during the year which imposed impossible conditions for development of these two properties.

Conversations were held during the year with various Japanese and European smelting companies for financing the Cuajone venture. So far progress has been extremely slow and the outcome of the negotiations cannot be predicted at this time. The Cuajone project, because of difficult terrain involving a very large pre-mine stripping program, is estimated to cost more than $400 million.

As in past years, we have continued to have the full support of our employees, stockholders, customers and suppliers for which, on behalf of the Board of Directors, we wish to express our appreciation.

E. McL. Tittmann, Chairman
Charles F. Barber, President

February 23, 1971

Asarco

World Of Minerals

- Asarco Mines and Plants
- Coal Mines (Midland Coal Company)
- Neptune Gold Mining Company *(51.8% owned)*
- Southern Peru Copper Corporation *(51.5% owned)*
- Mount Isa Mines Limited *(52.7% owned)*
- Granduc *(50% interest)*
- Asarco Mexicana, S.A. *(49% owned)*
- Nonferrous Metal Products and Alloy Plants *(Federated Metals Division)*
- Surface Treatment Chemicals and Equipment *(Enthone Incorporated; Ionic International, Inc.)*

MINES

Black Lake, Quebec, Canada *(Asbestos)*
Buchans, Newfoundland, Canada *(Zinc, Lead, Copper)*
Leadville, Colorado *(Zinc, Lead)*
Northport, Washington* *(Zinc, Lead)*
Quiruvilca, Peru *(Copper, Silver, Zinc, Lead)*
Sahuarita (Mission), Arizona *(Copper, Silver, Molybdenum)*
Sahuarita (San Xavier), Arizona *(Copper)*
Silver Bell, Arizona *(Copper, Silver, Molybdenum)*
Vanadium (Ground Hog), New Mexico *(Zinc, Lead)*
Wallace (Galena), Idaho *(Silver, Copper)*

Edwards (Edwards), Illinois *(Coal)*
Trivoli (Elm), Illinois *(Coal)*
Victoria (Mecco), Illinois *(Coal)*
Wyoming (Allendale), Illinois *(Coal)*

Bonanza, Nicaragua *(Gold, Zinc, Lead)*

*Closed, December 1970

Toquepala, Peru *(Copper, Molybdenum)*

Mount Isa, Queensland, Australia *(Copper, Lead, Silver, Zinc)*
Bowen, Queensland, Australia *(Coal)*

Stewart, British Columbia, Canada *(Copper)*

Charcas, San Luis Potosí, Mexico *(Zinc, Lead, Copper)*
Inguaran, Michoacan, Mexico *(Copper, Silver)*
Nueva Rosita, Coahuila, Mexico *(Coal)*
Parral, Chihuahua, Mexico *(Lead, Zinc, Fluorspar)*
Plomosas, Chihuahua, Mexico *(Zinc, Lead)*
Santa Barbara, Chihuahua, Mexico *(Zinc, Lead, Copper, Silver)*
Santa Eulalia, Chihuahua, Mexico *(Zinc, Lead)*
San Martín, Zacatecas, Mexico *(Zinc, Copper, Silver)*
Taxco, Guerrero, Mexico *(Zinc, Lead, Silver)*

SMELTERS AND REFINERIES

Amarillo, Texas *(Zinc)* (S)
Baltimore, Maryland *(Copper, Silver, Gold, Tellurium, Selenium)* (R)
Corpus Christi, Texas *(Zinc, Cadmium)* (R)
Denver, Colorado *(Cadmium, Indium, High-purity Metals)* (R)
East Helena, Montana *(Lead)* (S)
El Paso, Texas *(Copper, Lead)* (S)
Glover, Missouri *(Lead)* (S, R)
Hayden, Arizona *(Copper)* (S)
Omaha, Nebraska *(Lead, Bismuth)* (R)
Perth Amboy, New Jersey *(Copper, Silver, Gold, Selenium, Tellurium, Platinum, Nickel)* (R)
Selby, California* *(Lead, Silver, Gold)* (S, R)
Tacoma, Washington *(Copper, Arsenic)* (S, R)

*Closed, December 1970

Ilo, Peru *(Copper)* (S)

Mount Isa, Queensland, Australia *(Lead, Copper)* (S)
Northfleet, Kent, England *(Lead, Silver)* (R)
Townsville, Queensland, Australia *(Copper)* (R)

Chihuahua, Chihuahua, Mexico *(Lead)* (S)
Monterrey, Nuevo León, Mexico *(Lead, Silver, Gold, Bismuth, Selenium)* (R)
Rosita, Coahuila, Mexico *(Zinc, Coke)* (R)
San Luis Potosí, San Luis Potosí, Mexico *(Copper, Arsenic)* (S)

NONFERROUS METAL PRODUCTS AND ALLOY PLANTS

Houston, Texas *(Copper-Base Alloys, White Metals, Lead Products, Lead Construction, Cathodic-Protection Anodes)*
Newark, New Jersey *(Copper-Base Alloys, White Metals, Cathodic-Protection Anodes, Lead Sheet)*
Perth Amboy, New Jersey *(Copper-Base Alloys, Lead Products, Aluminum Alloys, Continuous-Cast Alloys)*
San Francisco, California *(Copper-Base Alloys, White Metals, Lead Products)*

Sand Springs, Oklahoma *(Zinc Dust)*
Somerville, New Jersey *(Bronze Products, Brazing Alloys)*
Trenton, New Jersey *(Zinc Dust)*
Whiting, Indiana *(Copper-Base Alloys, White Metals, Zinc Dust)*
Montreal, Quebec, Canada *(White Metals, Lead Products, Lead Construction)*
Toronto, Ontario, Canada *(White Metals, Zinc Die-cast Alloys, Metal-Finishing Specialties)*

SURFACE-TREATMENT CHEMICALS AND EQUIPMENT

West Haven, Connecticut *(Metal-Finishing Specialties)*

Chicago, Illinois *(Metal-Finishing Specialties)*
Cleveland, Ohio *(Electroplating Specialties)*
Warren, Michigan *(Ionic Automatic Plating Equipment)*

Asarco mines and concentrating mills operated at near capacity throughout the year, producing ores and concentrates containing copper, lead, zinc, silver, gold and molybdenum, as well as coal and asbestos. Mission mine (above) is Asarco's largest in the United States.

MINING

Southwestern Copper Mines Operated at Satisfactory Rates

Mission The Mission Unit increased the tonnage of ore mined and milled to an average of 22,518 tons a day during 1970. Tonnage of copper concentrates was slightly lower than in 1969, however. More than 8 million tons of ore was mined and milled during the year, producing 174,176 tons of copper concentrates which contained 47,678 tons of copper and 624,248 ounces of silver. Also produced was 788,862 pounds of molybdenum in molybdenum concentrates.

The Mission Unit is located near Tucson, Arizona.

Silver Bell Slightly less ore was mined and milled than in 1969, as a result of processing harder ore and a production cut-back when smelter capacity was curtailed.

Silver Bell mined and milled nearly 3.8 million tons of ore, producing 67,391 tons of concentrates which contained 19,698 tons of copper and 235,518 ounces of silver. Also produced was 3,490 tons of copper precipitates containing 2,833 tons of copper, and 420 tons of molybdenum concentrates containing 429,461 pounds of molybdenum.

Silver Bell is northwest of Tucson.

San Xavier At the San Xavier mine, adjacent to Asarco's Mission Unit, mining of copper-bearing siliceous flux ore continued throughout the year. Start of construction of a plant to treat San Xavier copper-oxide ore by leaching has been delayed due to the institution of litigation by the lessors, the Papago Indian tribe.

Midland Coal Company operations (right) are located in the northwestern Illinois coal field west of Peoria. The four mines comprising the division were acquired in 1970; each is an integrated operation producing washed bituminous coal, nearly 90 percent of which is sold through medium- to long-term contracts to expanding midwestern public utilities and industries.

Near Wallace, Idaho, the Galena No. 3 shaft was sunk 600 feet below the silver-copper mine's lowest operating level. Shaft extends more than 4,900 feet from pulley of headframe (below) into mine.

The San Xavier mine produced 63,831 tons of siliceous flux ore, which contained 465 tons of copper.

Sacaton As a result of further drilling at the Sacaton project near Casa Grande, Arizona, ore reserves increased to 48 million tons of copper ore assaying 0.95 percent copper. Metallurgical testing of ore samples was concluded during the year and preliminary designs for an open-pit mine, mill and surface facilities were completed.

Ground Hog Production of lead and zinc concentrates was considerably higher in 1970 from this mine at Vanadium and mill at Deming, New Mexico.

The unit mined and milled 122,417 tons of ore, producing 31,540 tons of concentrates with a content of 3,174 tons of lead in lead concentrates; 14,179 tons of zinc in zinc concentrates; and 161,204 ounces of silver.

Idaho Silver Projects Active; Leadville Ready for Mining

Galena The Galena Unit mined and milled 154,258 tons of ore, producing 4,520 tons of concentrates which contained 3,619,630 ounces of silver and 1,261 tons of copper. The Galena Unit produced at an average rate of 12,855 tons of silver-copper ore per month during the year. Development of the 4600 level will begin following completion early in 1971 of skip pockets and sump. A continuing shortage of miners prevented full utilization of the mill's capacity.

The property is owned by Callahan Mining Corporation and leased to Asarco. Day Mines, Inc. has a 25-percent interest in the Asarco lease.

Silver Belt Projects At the Coeur project, development work exposed additional ore on three levels of the Coeur shaft, two miles west of the Galena shaft. Underground exploration on the Camp project and development work on the Consolidated Silver project, further to the west, proceeded according to plan.

Leadville At the Leadville, Colorado Unit, the new 1,650-foot shaft was completed and underground development of the ore body proceeded on schedule. Construction of the 700-ton-per-day mill was begun during the year, and mine production is expected to commence in March 1971.

Ore reserves are unchanged at an estimated 2.4 million tons averaging 15 percent combined lead and zinc with significant quantities of silver and gold. Asarco is the operator in a joint venture with a subsidiary of Newmont Mining Corporation. The companies have equal interests in the venture.

Van Stone In December, this lead and zinc open-pit mine at Northport, Washington, was closed, its reserves having been exhausted.

Buchans Production Down; Tungsten Mining Studied

Production at the Buchans Unit in Newfoundland was slightly below that of 1969.

The mill treated 359,000 tons of ore and produced 8,576 tons of copper concentrates, 35,712 tons of lead concentrates and 64,325 tons of zinc concentrates. Silver in the concentrates totaled 1,146,489 ounces.

Development work continued in the tungsten ore body at the Grey River village on the south coast of Newfoundland. A large representative sample of the ore body was sent to the Canadian Department of Mines, Energy and Resources for testing.

Quiruvilca Unharmed by Quake; Michiquillay Concessions Cancelled

Quiruvilca Except for a brief interruption following the disastrous earthquake in May, operations at the Quiruvilca mine of Northern Peru Mining Corporation, a wholly-owned subsidiary of Asarco, were at full capacity throughout the year.

Although the earthquake destroyed many villages in Peru's northern provinces, damage to the mine, plant and facilities was relatively minor.

A total of 295,053 tons of ore was mined and milled to produce 20,433 tons of copper concentrates, 2,395 tons of lead concentrates and 7,875 tons of zinc concentrates. The concentrates contained 1,045,359 ounces of silver. In addition, 740 tons of copper in precipitates were produced from mine drainage water.

Michiquillay In September, the Peruvian Government notified the Company that the Michiquillay mining concessions had been cancelled and that the Peruvian Government would take over control of the property.

The Michiquillay deposit, discovered by Asarco in 1958, is a large low-grade copper deposit located near Cajamarca in northern Peru. While the Company had invested a total of more than $7 million in exploration, development and engineering for the property, the aggregate cost of developing the property to produce copper concentrates has been estimated to be well in excess of $300 million. Recent changes in Peruvian mining laws made it impossible for Asarco to retain the property until such time as the development of this remote and low-grade deposit became economically feasible.

Lake Asbestos Sets New Production Record

Production of asbestos fibre by Lake Asbestos at Black Lake, Province of Quebec, set a new record in 1970.

Ore reserves are being maintained and mine development is progressing satisfactorily. Milling refinements are being made to increase production of grades suitable to growth markets.

The long-term outlook for asbestos is encouraging, and the market forecast for 1971 is good with most of the production already committed.

Cement Asbestos Products Company, of which Asarco owns 49 percent and The Mead Corporation owns 51 percent, had a difficult year due to a three-month strike at the Ragland, Alabama plant. The new plant at Van Buren, Arkansas has been producing plastic pipe and started asbestos-cement pipe production in January 1971.

Lake Asbestos of Quebec, Ltd.

(Short tons)	1970	1969	1968
Fibre produced	133,903	126,769	123,672
Fibre shipped	131,001	123,920	139,389

Careful consideration is given to ecology and environmental matters at Asarco mines. In Arizona, flowering plants and eucalyptus trees have been planted to beautify waste dumps (left). In Idaho, impounding ponds for mine tailings are designed to include plantings to enhance scenery, and ecological studies are being conducted in the area of the molybdenite deposit discovered by Asarco (see Exploration). In Illinois, Midland Coal Company is continuing and expanding 'Operation Green Earth,' begun several years ago. In New Jersey, plans are being made to reclaim and revegetate the mined area as mining of ilmenite progresses.

Steam billows to roof (right) as water cools copper anodes being cast at El Paso metallurgical complex. Although most smelters were on seven-day-a-week schedules, production was significantly less than capacity—due largely to increasingly restrictive air quality standards. Curtailment of production at the Company's three copper smelters because of air quality regulations, compelled Asarco to declare a condition of force majeure and shippers of copper concentrates were placed on a quota system beginning June 1.

Asarco Acquires Coal Mines, Forms New Operating Division

Asarco purchased four Illinois surface coal mines from Peabody Coal Company in November. These properties are being operated as the Midland Coal Company division. Transfer of management of these properties and about 600 employees was accomplished in orderly fashion. Division headquarters was established at the Elm mine at Trivoli, Illinois in Peoria County.

The Division has a capacity of 6 million tons of washed coal per year. Controlled reserves are capable of supporting production at that rate for more than 20 years.

Asarco to Mine Titanium-bearing Minerals in New Jersey

In January 1971, a 10-year agreement was concluded with E. I. du Pont de Nemours & Company under which Asarco annually will supply Du Pont with 140,000 to 168,000 tons of titanium dioxide minerals (ilmenite) from a new mining operation in New Jersey, subject to confirmation of capital and operating cost estimates. The mineral deposit was discovered by Asarco geologists in 1957.

Du Pont will process the ilmenite to produce titanium dioxide, a white pigment which is used chiefly in the manufacture of paints, plastics and paper.

The mine will be located on Company-owned property in Manchester Township, near Lakehurst, New Jersey. The ore will be mined by a dredge at a rate of over 20,000 tons per day. The titanium-dioxide-bearing minerals will be separated and upgraded by gravity, electrostatic and electromagnetic processes.

Engineering and construction of the mine and mill are expected to take about two years.

SMELTING AND REFINING

Copper Plants With a designed annual charge capacity of 960,000 tons, the Hayden, Arizona plant is Asarco's largest domestic copper smelter. Construction of the sulfuric-acid plant at Hayden is nearing completion and should be fully operational when gas handling facilities are finished in the fall of 1971. The acid plant will reduce substantially sulfur dioxide emissions from the smelter. Completed cost is estimated at $17 million. Output of the plant will be sold to metallurgical, agricultural and chemical industries in Arizona and New Mexico.

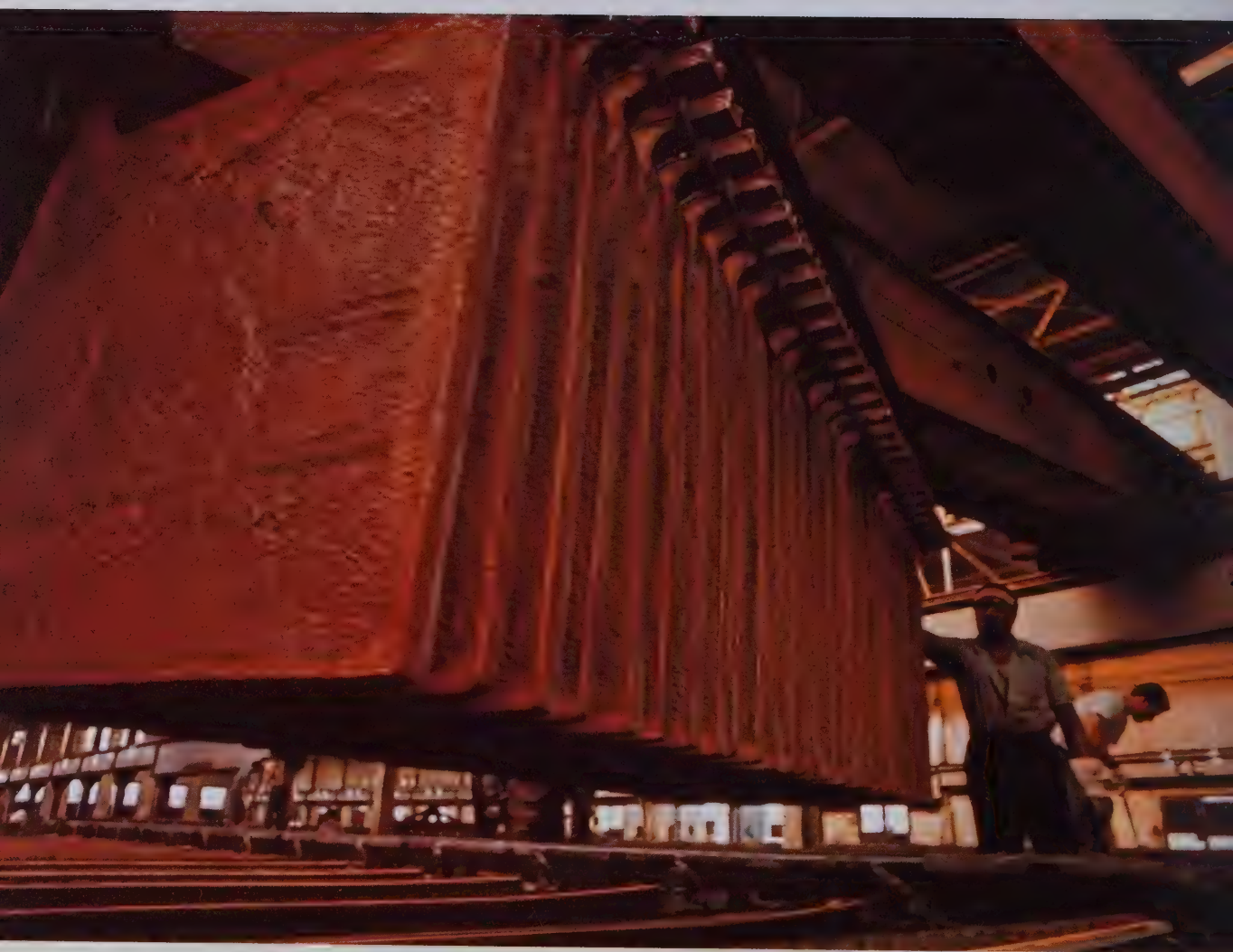
The El Paso, Texas plant is a large metallurgical complex comprising a copper smelter, lead smelter, zinc fuming plant and cadmium roasting plant. Copper smelter operations were curtailed extensively during the year to control ambient air concentrations of sulfur dioxide. This program was facilitated by a computerized system which was installed to aid meteorological personnel to project optimum operating requirements in relation to meteorological conditions.

Also during the year, the plant nearly completed expansion of its Cottrell electrostatic precipitators, and installed a new baghouse system and after-burners to reduce in-plant fume emissions. These improvements in air pollution control will cost approximately $1.6 million.

In April, Asarco entered into a joint project with Phelps Dodge Corporation to build a pilot plant to test the new Asarco process for converting sulfur dioxide into elemental sulfur. This pilot plant is being constructed at the El Paso plant. The program is expected to cost approximately $2.5 million.

In September, the Company announced plans to build a 500-ton-per-day sulfuric-acid plant at the El Paso plant to recover a substantial portion of the sulfur dioxide that is produced in the copper smelting operation. Bids are now being taken for the new installation, estimated to cost between $15 and $20 million. It will take 27 months to design, engineer, build and put the facility into operation. The acid plant will reduce substantially sulfur-dioxide emissions.

The Tacoma, Washington plant was shut down for a seven-week period during the first quarter as a result of a flue collapse and operated below capacity during the period of April-September,



From copper anodes being placed in electrolytic cells (above), Asarco refineries at Baltimore, Maryland, Perth Amboy, New Jersey and Tacoma, Washington produce 99.9+ percent copper. Silver, gold, selenium, tellurium, platinum, and nickel sulfate are recovered as by-products. The Perth Amboy plant also produces a wide variety of continuous-cast bronze rod and tube, electroplating copper anodes, aluminum, bronze and brass ingot and lead sheet and pipe (all marketed by Federated Metals Division).

because of the need to curtail smelting operations at those times when meteorological conditions resulted in poor dispersion of stack gases.

The Company has proposed to build a 200-ton-per-day liquid sulfur dioxide plant at a cost in excess of $10 million to reduce emissions of sulfur dioxide by more than 50 percent. With such a plant the smelter would be able to meet current ambient air quality standards. In order to make the construction of this facility economically tolerable, the Company is seeking a five-year variance from the applicable emission standard which requires removal of an arbitrary 90 percent of the sulfur entering the process.

The second phase of a two-stage expansion of the Tacoma refinery was completed in 1970, providing an additional 50,000 tons per year of electrolytic copper refining capacity, raising total capacity to 156,000 tons per year.

At Asarco's Baltimore, Maryland plant, modifications to processes were completed to increase recovery of selenium and tellurium.

A major research and engineering effort has been undertaken at the Perth Amboy, New Jersey plant to find feasible ways of meeting the state's air-pollution regulations. The Perth Amboy plant is one of Asarco's most diversified operations.

Lead Plants Asarco's Glover, Missouri smelter and refinery in Missouri's new "Lead Belt" operated well until September, when the labor contract expired and the plant was struck. Extremely difficult negotiations with the union ensued and, at year end, the plant was still down.

Anti-pollution efforts undertaken during the year included installation of a system to monitor smelter stack emissions more efficiently and a Venturi "scrubber" to clean gases before they reach the stack.

The East Helena, Montana plant is one of the country's largest custom lead smelters — processing crude ores and concentrates from approximately 60 small Montana mines as well as from mines in Canada, Idaho, Utah, Colorado, Australia and South America. It represents about 12 percent of total U.S. lead smelting capacity.

Besides curtailing operations to meet ambient air standards, the plant last summer added to its control equipment a conical discharge atop the 400-foot smelter stack. The cone increases the discharge velocity 2.6 times and supplements a high-volume fan and stack heater which were installed last year to improve plume rise and dispersion.

Operations at the Omaha, Nebraska plant were satisfactory throughout the year. To assure compliance with local air quality control regulations, new equipment was installed and various changes engineered to improve ventilation, minimize smoke and reduce fume emissions.

In July 1970, Asarco announced that the Selby, California lead smelter and refinery would be closed after 85 years of continuous operations. A combination of rising costs, increased taxes, and changing patterns in world trade in lead made the plant economically obsolescent. It had operated at 50 to 60 percent of capacity for the past several years and the new cost burdens made it impossible to operate except at a substantial loss.

Closing of the Selby plant will have little effect, if any, on Asarco's position in the lead market since customers in the area will be served by Asarco's other lead facilities. Operations at Selby were phased out in an orderly fashion.

Zinc Plants Production at the Amarillo, Texas zinc plant, which has been operating continuously since 1922, were somewhat below normal for about half the year due to a shortage of labor. State air control board regulations governing particulate emissions threaten the continued operation of plants which produce zinc by the horizontal retort method. The plant is operating under a variance extending to May 1971 while studies are carried on to determine if any economically tolerable and technically feasible means exist to control such emissions. Previous studies have failed to yield any acceptable solution.

The Corpus Christi, Texas plant suffered nearly half a million dollars in damages in August as a result of Hurricane Celia. Fortunately, none of the plant's personnel were injured by the storm and most of the damage was limited to water damage to electrical equipment. Due to the interruption of power, however, the plant was totally out of operation for several days. Operations returned to normal about the first of September. In all, nearly half-a-month's production was lost. The 100,000-ton-capacity refinery produces Special High Grade zinc which is used primarily in die casting applications.

During the year, installation of fluid bed roasting facilities was begun with completion expected early in 1972. This replacement of two old flash roasters will increase capacity and reduce operating costs.

The plant has no air quality problems. Water-quality control regulations will require installation of equipment to purify plant effluents and normal run-off at an estimated cost of $2 million.

Cadmium, High-Purity Metals Facilities. Asarco's Globe Plant in Denver, Colorado is an important producer of refined cadmium and cadmium compounds, which are used for protective plating of metal parts, in plastic pigments, low-melting alloys, television phosphors and certain types of batteries.

During the year, operations were begun at a new laboratory and high-purity metals plant at Globe producing high-purity cadmium, indium, lead, zinc, arsenic, antimony, silver, sulfur and thallium. These high-specification items, used primarily in metallurgical research, were previously produced at Asarco's Central Research Laboratories.

RECYCLED METALS

Federated Metals Affected By Decline In Metal Prices

Through its Federated Metals Division, Asarco is one of the country's major consumers of nonferrous scrap which it reclaims and processes into more than 75 different products, ranging from aluminum alloys to zinc dust.

In 1970, Federated purchased 139,487 tons of scrap containing copper, lead and zinc for consumption by its own plants as well as by other Asarco smelters and refineries. This not only minimized solid waste disposal burdens, but also resulted in the recovery and return of a large quantity of useful metals to the mainstream of the country's economy.

Federated's earnings in 1970 were adversely affected by the downward movement in metal prices as well as by a lessening in demand for its major product lines. Shipments were off approximately 15 percent from 1969. Easing of copper export quotas by the U.S. Government during the third quarter resulted in a temporary disruption in the availability of scrap copper and brass used in Federated's recycling processes.

During the year, engineering studies were conducted at Federated plants on various types of air quality control equipment to determine feasible means of meeting local and state air quality requirements.

The San Francisco and Houston plants both made substantial investments during the year in remelting and casting equipment and additional air quality

control equipment. At Los Angeles, construction was begun on a modern warehouse facility.

Federated Metals Canada Limited improved its market penetration in 1970, despite the slowdown in Canadian business activity.

PLATING MATERIALS

Enthone Offers New Products, Enters Plating Equipment Field

Enthone Incorporated, a wholly-owned subsidiary, specializes in the production of chemical materials for the metal plating and finishing industry.

In 1970, Enthone introduced a completely cyanide-free process for rack zinc plating and a new cyanide-free stripper for removing nickel from steel. In addition, two new products for alkaline de-scaling of steel were released, one of which uses one tenth the amount of cyanide normally found in such materials, and the other requiring no cyanide whatsoever. Such products are expected to assist the plating industry in dealing with water pollution problems.

In January 1971, Enthone acquired Ionic International, Inc. of Warren, Michigan, a manufacturer of automatic plating equipment. The Ionic line of equipment complements the Enthone line of chemicals.

EXPLORATION

Search for Minerals in 1970 Took Asarco to 19 Countries

Exploration activities to find new ore supplies were at the highest level in the Company's history. Geologic examinations and exploration projects were carried out in 19 countries on five continents. Major efforts were concentrated in countries known for their stability and which favor development of their resources by private enterprise.

In the U. S., continuing exploration programs were carried out in the western mountain states and in Tennessee, Kentucky, Illinois and Indiana. There was sufficient encouragement at several of these projects to justify further work.

Work has been suspended at the Little Boulder Creek molybdenite deposit in the White Cloud Peaks area of Idaho pending resolution of land use issues and the outcome of ecological studies being conducted by Asarco, the Forest Service and others.

In Canada, Asarco's airborne electromagnetic search for mineral deposits was intensified. The total area covered and the number of targets drilled was more than double that in any previous year. In western Canada, where the emphasis was on the search for disseminated mineral deposits, extensive reconnaissance and drilling indicated several low-grade copper occurrences which will be held for possible future development.

RESEARCH

Research Directs Efforts Toward Elemental Sulfur, Operations, Products

Programs of the Research Department are closely associated with Asarco's expanding interest in exploration, ore beneficiation, smelting, refining, product application and product development.

Elemental Sulfur Project In the area of smelting research, efforts continued toward the development of processes applicable to the recovery of sulfur dioxide from various smelter gases and the ultimate conversion of sulfur dioxide to a marketable product. Development of such processes is essential to meeting the new air quality control standards.

Early in 1970, preliminary engineering studies relating to the development of an elemental sulfur process were sufficiently encouraging to justify a decision authorizing the construction and operation of a large pilot plant. Construction is currently underway at the Asarco smelter in El Paso, Texas and it is anticipated that the plant will be completed in mid-1971. The plant has a designed capacity of 20 tons per day of sulfur, based upon reduction of sulfur-dioxide gas.

If the operation proves successful, an additional two years may be required to obtain the data necessary for the design and construction of an operating plant.

The project is jointly supported by Phelps Dodge Corporation.

Electric Vehicles Have Potential Continued interest in lead-acid batteries and associated electric vehicle developments placed Asarco in the 1970 Clean Air Car Race. One of two electric delivery vans at the Central Research Laboratories in South Plainfield, New Jersey entered the cross-continental competition under sponsorship of Stevens Institute of Technology.

While not designed for cross-country travel, the van was first of the electric cars to cross the finish line, and demonstrated that electric vehicles utilizing lead-acid batteries are capable of very demanding service requirements. The van averaged 450 miles per day for 3,600 miles at a power cost of less than 1.5¢ per mile.

Based upon this performance, electric vehicles deserve serious consideration as an integral part of the nation's transportation system, particularly for short-haul delivery service. Asarco research is continuing to assist in the development of these vehicles.

Zinc-Rich Paints Promising Research activities in the area of corrosion protection include investigation of zinc and zinc alloys for hot dip and continuous galvanized coatings, zinc anodes for cathodic protection, and zinc dust (metallic zinc powder) for zinc-rich paints. The excellent corrosion resistance of zinc-rich paints has encouraged the application of very thin coatings of this paint on sheet steel for use in the construction, appliance, and automotive industries. In cooperation with the Company's plant personnel, procedures were developed for producing a special zinc dust for these applications. Initial trials using this special zinc dust in paints have been encouraging.

Industry-Wide Research Programs The Research Department also participates actively in a number of industry-wide research and development organizations. These include the International Copper Research Association, the International Lead-Zinc Research Organization, the Copper Development Association, and the Selenium-Tellurium Development Association.

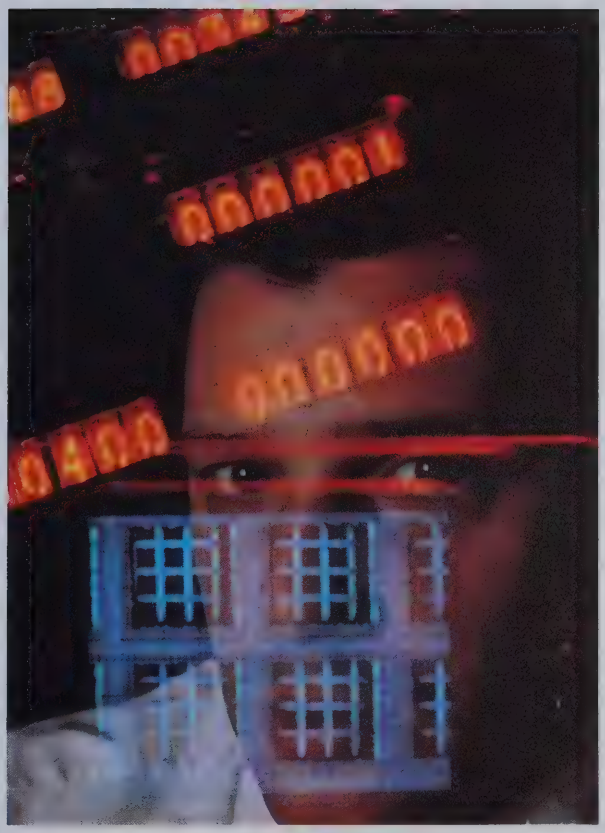
OTHER MINING ACTIVITIES

M.I.M. Holdings Limited

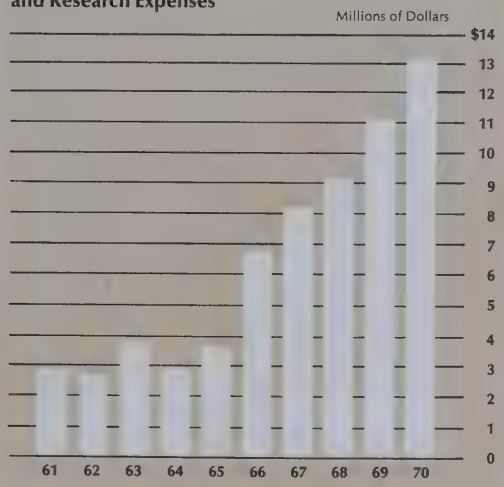
(formerly Mount Isa Mines Limited; 52.7-percent-owned by Asarco)

To provide a more flexible structure for future growth, Mount Isa Mines Limited was reorganized in October 1970 as a

Extending its ore reserves through new discoveries and making better use of resources through research are prime Asarco goals. Expenditures for these two functions in 1970 were at their highest level in the Company's history. The portable exploration drill (below) will produce a core from underlying rock for analysis. The electron-beam microprobe at Central Research Laboratories (right) can obtain chemical analytical data on volumes as small as one cubic micron (.00004 inch).



Exploration and Research Expenses



holding company with a number of operating subsidiaries. The new holding company, in which Asarco retains the same share of ownership, is known as M.I.M. Holdings Limited.

M.I.M. Holdings encompasses a complex of mining, milling and smelting operations for copper, lead, zinc and silver at Mount Isa in Queensland, Australia, a copper refinery and rod mill at Townsville, Queensland, a lead and silver refinery at Northfleet, near London, England, and a number of other subsidiary activities.

Mount Isa The annual report of Mount Isa Mines Limited for the fiscal year (ended June 28) described 1970 as the "most dynamic" in its 46-year history. An expansion program is expected to make it the Free World's largest individual producer of lead and silver, as well as a major copper and zinc producer.

Consolidated net earnings for the fiscal year (restated in U.S. dollars) increased to $62,072,000 compared with the previous record of $31,057,000 in the prior fiscal year.

Ore tonnage treated in the 12 months increased nearly 20 percent over the previous year to a total of 6.6 million tons, in excess of 18,000 tons per day.

Also noteworthy was a substantial increase in ore reserves. As of June 28, 1970, the company estimated the reserves of the Mount Isa mine at 134.4 million short tons of primary copper ore with a 3 percent copper content (compared with 84 million tons a year earlier), and 58.2 million tons of primary silver-lead-zinc ore (compared with 50.4 million tons the previous year).

As a result of the increase in reserves of copper, Mount Isa has embarked on a program to increase its output of copper from about 110,000 tons per year to approximately 170,000 tons per year. This program will include a new hoisting shaft and concentrator for copper ore, extensions to the copper smelter at Mount Isa and increased refinery capacity at Townsville.

Mount Isa's expansion program also includes expansion of the lead smelter and installation of refining facilities to process the lead from ore to be produced by the Hilton mine, construction of a zinc fuming plant for recovery of zinc from lead smelter slag, expansion of electric power facilities and construction of additional housing.

Hilton Plans for development of the Hilton mine 12 miles north of Mount Isa are on schedule and contracts have been let for the sinking of the two major shafts in the area. Production from the Hilton mine will approximately double Mount Isa's lead production to 313,000 tons per year. Zinc concentrate production will also be about doubled and there will be a substantial increase in the silver production.

Reserves have been estimated, on the basis of drilling to date, at 39.2 million tons of silver-lead-zinc ore containing 5.8 ounces of silver per ton, 7.7 percent lead and 9.6 percent zinc. Diamond drilling at the Hilton mine has intersected additional ore, but, under standard practice, additional drilling is necessary before it can be added to reserves.

Southern Peru Copper Corporation

(51.5-percent-owned by Asarco)

Southern Peru Copper Corporation operates a large open-pit copper mine and mill at Toquepala in southern Peru and a smelter, power plant and port at Ilo on the seacoast. The table on page 15 shows Southern Peru's production for the last three years.

Net earnings of Southern Peru were $37,432,000 in 1970, compared with $65,652,000 in 1969. The lower earnings were due to a lower average price received for its copper and an increase in the Peruvian income tax rate effective January 1, 1970 from 54.5 percent to approximately 68 percent.

Toquepala Operations at Toquepala were satisfactory. Production of blister increased.

Production of molybdenum concentrates improved during the year both as to quantity and quality after the development of a process more suitable to the mineralogical characteristics of the Toquepala ore.

The mine and concentrator were interrupted for 20 days by three separate laborers' strikes, 17 days of which were in sympathy with strikes at other mining operations not connected with Toquepala.

Operations were continuous at the smelter at Ilo throughout the year.

Quellaveco During the year, the Peruvian Government promulgated significant new legislation: a new basic law of mining (which at year's end was not yet fully implemented), and a law requiring holders of concessions containing large undeveloped ore bodies to show proof of financing by December 31, 1970 or have the concession revert to the State. These new laws did not affect the status of the Cuajone project which is governed by a Bilateral Agreement with the Government of Peru, but Southern Peru's Quellaveco concession (with approximately 200 million tons of 0.94 percent copper reserves) was declared cancelled in January 1971 on the ground that Southern Peru had not submitted timely proof of financing for the concession. An appeal of this ruling was rejected. In the judgment of the Board of Directors of Southern Peru Copper Corporation, for the most efficient operation, the Cuajone and nearby Quellaveco deposits should be regarded as a single mining unit, producing ore for processing at the Cuajone mill.

Cuajone The work calendar programmed for the Cuajone mine proceeded on schedule. The new access road was completed. Work was started on the railroad tunnels which will eventually link Cuajone with Toquepala, 17 air-line miles to the southeast. Some mining equipment was received and stripping of the over-burden on the ore body began in November 1970. Approximately $13,639,000 was spent during the year on field work and equipment purchases. This sum is part of the amount claimed as percentage depletion under Peruvian law. Such amounts claimed must be reinvested within three years. At the end of 1970, about $22,139,000 of the accumulated requirement for investing depletion remained to be satisfied.

Early in the year, negotiations were initiated with a group of European and Japanese smelting and refining companies and with international financing institutions looking toward arranging financing for the Cuajone project, which is now estimated to cost about $400 million. While definite interest has been displayed by the group, no agreement

Mount Isa Mines Limited

(Production in short tons)	Year Ended June 28, 1970	Year Ended June 30, 1969	Year Ended June 30, 1968
Ore treated	6,637,000	5,554,000	4,047,000
Metal content of products:			
Silver (ounces)	11,717,000	10,045,000	7,274,000
Copper	92,847	81,374	53,923
Lead	168,380	131,388	99,210
Zinc	102,283	87,685	54,889

Southern Peru Copper Corporation

(Production in short tons)	1970	1969	1968
Total ore and waste mined	68,355,000	64,301,000	68,819,000
Ore treated	15,318,000	13,206,000	14,392,000
Blister copper	149,101*	134,234	147,721
Molybdenum concentrates	1,156	325	1,572
Grade of ore milled	1.14%	1.18%	1.21%

*includes 6,207 tons of copper exported in concentrates.

Asarco Mexicana, S.A.

(Production in short tons)	1970	1969	1968
Ore mined	2,299,000	2,142,000	1,995,000
Gold (ounces)	85,296	70,972	72,794
Silver (ounces)	15,687,000	16,706,000	19,050,000
Blister copper	27,110	25,879	23,880
Refined lead	83,276	82,541	76,484
Refined zinc	66,157	64,869	65,144
Zinc in concentrates and fume sold	55,058	55,957	40,866
Fluorspar	47,026	41,273	7,059
Coal mined	894,098	873,338	773,543
Coke	456,904	472,847	452,719

has yet been reached and the outcome of the negotiations cannot be predicted at this time.

Asarco Mexicana, S.A.
(49-percent-owned by Asarco)

Operations at the eight mines and four plants of Asarco Mexicana were maintained at satisfactory levels during 1970.

The table above compares production for the past three years. This production came from ores and coal mined by the company and from materials purchased from others for smelting at its lead and copper plants.

Dividends totalling $3,840,000 (of which Asarco received $1,883,000) were paid in March 1970. Capital expenditures during the year totalled $15,547,000.

Construction of the mine, mill, town site and supporting facilities at the Inguaran mine in the State of Michoacan is virtually complete and production began in the first quarter of 1971. The 2,200-ton-per-day mill is expected to produce annually concentrates containing about 13,000 tons of copper and 78,000 ounces of silver. A new converter and blower have been installed and other modifications made at the copper smelter at San Luis Potosí to handle the Inguaran concentrates. The feasibility of installing a copper refinery at San Luis Potosí to process the smelter's increased production of blister is under study.

Asarco Mexicana's mine expansion and modernization program continued. The new 660-ton-per-day mill at the San Martin Unit began operations at mid-year; the new 350-ton-per-day mill at the San Antonio mine of the Santa Eulalia Unit will be completed in 1971; and major mine development work continued at the Santa Barbara and Taxco Units. Ore reserves were well maintained at all units except Parral, where reserves declined.

At the Chihuahua lead smelter a new updraft sintering plant is under construction and will be completed during the year. This, together with other modifications and improvements at the smelter and at the Monterrey lead refinery, will enable Asarco Mexicana to treat substantially increased tonnages of lead concentrates.

Good progress was made at the Sabinas No. 2 coal mine at Nueva Rosita which is being developed to produce 55,000 tons of coking coal per month.

Mexicana de Cobre, S.A. Mexicana de Cobre, S.A., 49-percent-owned by Asarco Mexicana, continued engineering studies at the La Caridad property near Nacozari in the State of Sonora. As previously reported, the property contains a major porphyry copper ore body. Studies are underway by Mexicana de Cobre to determine the optimum plan for developing the property.

Neptune Gold Mining Company
(51.8-percent-owned by Asarco)

At the Neptune mine in Nicaragua, which has been a gold producer for 32 years, gold ore reserves continued to decline and production for the year was approximately 80 percent of 1969.

Development of the adjacent Vesubio lead-zinc mine is proceeding on schedule, and it is anticipated that operations will begin during the summer of 1971. A new shaft, 715 feet deep, has been completed and the installation of an underground crusher station is well underway. Construction of the new flotation mill, auxiliary buildings and 20 miles of new road is progressing according to schedule.

Concentrates will be transported by truck and river barge to an eastern seaport. At full capacity, 2,800 tons of zinc concentrates and 500 tons of lead concentrates per month will be shipped to Asarco plants in the United States.

Granduc
(50-percent Asarco interest)

Production of copper concentrates on a limited basis began on November 1, 1970 at Granduc in British Columbia. Full operation at a rate of 7,500 tons of ore per day should be attained late in 1971.

The Granduc property is leased from Granduc Mines Limited by Asarco and

the Granduc Operating Company in equal shares. Granduc Operating Company, a wholly-owned subsidiary of Newmont Mining Corporation, is operator and manager of the project. During 1970, Granduc Operating spent $28 million (Canadian currency) on the project, bringing the total cost to approximately $115 million (Canadian currency), including working capital.

EMPLOYEE RELATIONS

New Labor Agreements To Be Negotiated in 1971

Asarco's programs devoted to safety, health, employee environment, management development, and equal opportunity were vigorously pursued. Similarly, support of higher education and its institutions, educational refund plans for employees, scholarship grants and awards to colleges and universities continue to play an important role in the Company's activities.

There was a shortage of labor at many of the plants and mines, affecting productivity at these facilities.

Labor agreements terminate at most of Asarco's United States plants and mines during the last half of 1971, starting with copper mines and plants on June 30, followed by Federated Metals Division on September 30, and by lead and zinc mines and plants on December 31. The Midland Coal Company labor contract expires on September 30.

During the year, two new labor contracts were successfully negotiated without work stoppages—at Lake Asbestos of Quebec and the Toronto plant of Federated Metals Canada Limited.

The labor contract at the Glover, Missouri lead smelter and refinery expired September 1 and the plant was struck. Negotiations continued as 1971 began, with the assistance of the Federal Mediation and Conciliation Service.

EXECUTIVE CHANGES

At the annual meeting, Directors Richard G. Croft and J. D. MacKenzie retired.

In April, William R. Bond, executive vice president of The Mead Corporation, was elected a director. Fletcher L. Byrom, chairman of the board of Koppers Company, Inc., was elected a director in August.

In April, K. D. Loughridge, 55, was elected vice president (smelting and refining). Mr. Loughridge, who joined the Company in 1940, had been general manager of the Western Smelting and Refining Department with headquarters in Salt Lake City, Utah.

Robert Devlin, 56, was appointed president of the Company's Midland Coal Company division following its formation in December. Mr. Devlin is a veteran of the coal mining industry, and brings to Asarco a broad background of senior management and consultation in the mining industries.

J Paul Harrison, vice president (purchasing), retired at the end of the year after 40 years of service with the Company. George Rafos, who joined the Company in 1926, has been appointed director of purchases.

A. L. Hatch, vice president (ore purchasing), died suddenly in March at age 50. Mr. Hatch was elected vice president in 1969. James G. Cox, who joined Asarco in 1939, has been appointed manager of the Ore Department.

LITIGATION

During the year, additional law suits alleging damages caused by air pollution were filed against the Company. Two of these were purported to be class

actions. Substantial amounts of damages were claimed, coupled in several instances with demands for injunctive relief against the allegedly polluting operations. One of the class action suits was dismissed without prejudice. In the second, the class-action allegation was withdrawn by stipulation. In another class action suit, instituted in December 1969, an order has been entered dismissing the class action allegation.

In June 1970, an action was instituted in the Federal District Court for the District of Arizona, by the Papago Indian Tribe seeking damages amounting to approximately $22 million and other relief in connection with Asarco's San Xavier mining project. It is expected that a trial will be held by the summer of 1971.

Separate actions were commenced in June and October 1970 in the Federal District Court for the Eastern District of Pennsylvania by two copper fabricating companies and their subsidiaries against the major U. S. copper producers, including Asarco, for damages in unspecified amounts and injunctive relief under the antitrust laws. In both of these suits it is claimed that the defendants unlawfully combined and conspired to restrain and monopolize trade and commerce in the production and fabrication of copper. Additional allegations claim violations of the anti-merger section of the Clayton Act and charge discriminatory pricing for copper fabricated products in violation of Section 2(a) of the Clayton Act.

The Company continued to oppose a suit in the Superior Court of the State of Arizona, instituted by a farming organization against several mining companies, including Asarco, with operations in the Santa Cruz Valley, south of Tucson. This suit seeks injunctive relief against the pumping and removal by these companies of underground water from their wells in the area.

It is the opinion of the Company and of its counsel that the outcome of the suits mentioned and of other miscellaneous litigation now pending will not materially affect the operations or the financial position of the Company or of any of its subsidiaries.

All surface and underground facilities were operational at Granduc as of December 1970. Completion of construction had been delayed by a dispute between contractors throughout British Columbia and their work forces. In all, strikes and labor disputes caused a total of approximately 10 months suspension of construction. At left, operator and console are reflected in glass wall overlooking one of concentrating plant's ball mills. Mill is linked with mine through 10.3-mile-long railroad tunnel.

Production Review

PRODUCTION OF REFINERIES	1970	1969	1968*	1967*	1966
Gold (Ounces)	697,514	696,625	591,751	433,411	773,943
Silver (Ounces)	71,091,575	85,478,566	66,763,776	47,557,769	76,216,974
Copper (Tons)	501,851	506,759	335,187	271,264	482,530
Lead (Tons)	225,968	207,275	153,106	120,722	224,830
Zinc (Tons)	130,659	140,929	124,019	139,710	155,650

*Production of Refineries in 1967 and 1968 was reduced by strike which lasted from July 1967 to mid-April 1968.

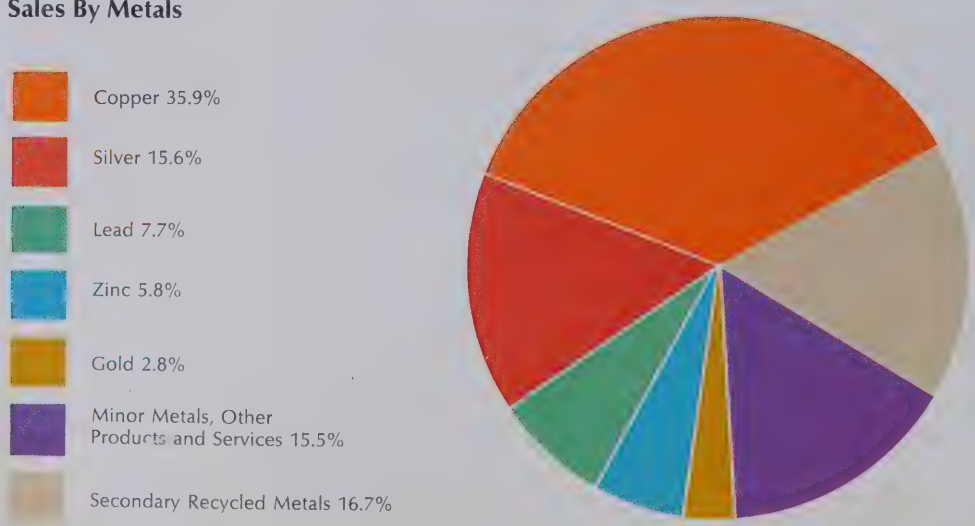
PRODUCTION OF MINES AND MILLS *Metal Content of Concentrates*					
Ore Milled (Tons)	13,100,366	13,016,080	10,810,464	9,500,636	10,979,450
Gold (Ounces)	11,051	12,450	12,816	11,593	10,615
Silver (Ounces)	6,838,228	6,467,979	5,186,605	5,421,820	8,005,176
Copper (Tons)	83,381	86,414	76,391	73,635	83,009
Lead (Tons)	28,357	29,640	28,268	31,781	34,237
Zinc (Tons)	63,311	62,990	54,353	67,228	75,408

*Production of Mines and Mills in 1967 and 1968 was reduced by strike which lasted from July 1967 to mid-April 1968.

PRICES OF MAJOR METALS *Yearly Averages*					
Domestic Copper (f.o.b. refinery per lb.)†	57.700¢	47.534¢	41.847¢**	38.226¢*	36.170¢
Foreign Copper (f.o.b. refinery per lb.)†	62.747	61.969	50.294	47.192	49.512
Domestic Lead (New York per lb.)†	15.619	14.895	13.212	14.000	15.115
Domestic Zinc (E. St. Louis per lb.)†	15.319	14.600	13.500	13.843	14.500
Silver (per oz.)††	177.082	179.067	214.460	154.968	129.300

†E & MJ/Metals Week Quotations. ††Handy & Harman Quotations.
*Based on first eight months 1967. Quotations were suspended September through December.
**Based on last nine months 1968. Quotations were suspended January through March.

Asarco Sales By Metals



Metal Markets

BUSINESS DECLINE PUTS PRESSURE ON PRICES; INVENTORIES RISE

The year 1970 began with excellent demand for nonferrous metals. Producer inventories were at a low level and prices, particularly for copper and lead, were firm.

The slackening in general business activity, however, began to affect the rate of consumer purchases during the second quarter. With production increasing and demand slackening, producer inventories started to rise and this, in turn, put pressure on prices.

The liquidity crisis which affected many major users of nonferrous metals led most managements of consumer companies to cut back the level of their working stocks in late 1970. As consumer stocks dropped, the rise in producer stocks was accelerated.

During the second half of the year, therefore, prices of metals almost without exception were under great stress. Published prices were reduced but profit margins were adversely affected to an even greater extent because of widespread discounting from published prices by some sellers, notably in lead and zinc.

At the end of the year the quoted prices for all Asarco's major products were lower than at its beginning. Furthermore, unsold inventories of copper, lead and zinc rose substantially.

COPPER: Long Period of Tight Market Ended in 1970

The high level of copper prices over recent years caused a further rise in mine and refinery production of copper during 1970. Declining economic activity in the United States and many of the other industrialized nations reduced consumption. Stocks of refined copper in the hands of Free World producers rose by almost 200,000 tons to the highest level in the last seven years.

Production of copper from U.S. mines in 1970 was the greatest ever recorded as several major new projects were completed in late 1969 and early 1970. The increase over 1969 production was 11 percent. A number of new mines also began production outside the United States, notably in Chile and Canada. Expansion projects at older mines also added to the supply. Furthermore, in comparison with recent years, 1970 was unusual in that there were no protracted interruptions of refined production during the year.

Free World refined copper production, as reported by the Copper Institute, was approximately 4.7 million tons, about 2 percent above 1969. These figures exclude Japan, an increasingly significant factor in the world's copper industry. Japanese refined copper production in 1970 is estimated to have been 780,000 tons, up 12 percent from 1969.

Japanese smelters have been buying copper concentrates and blister copper throughout the Free World predicated on an annual 10 to 12 percent increase in Japanese requirements. In 1970, however, Japanese consumption fell slightly. As a consequence, substantial surpluses developed. To relieve the pressure on their cash resources, Japanese refiners in 1970 sold about 50,000 tons of refined copper in export markets—the first such sales of any consequence from that country in many years.

Although the quantity involved represents only about 1 percent of Free World consumption of copper, nevertheless, the emergence of Japan as an exporter of refined metal caused a dramatic shift in world sentiment with respect to copper availability. Whereas during all of 1969 and the first quarter of 1970, there had been widespread talk of a permanent copper shortage, beginning in the second quarter of 1970, much more was heard about potential surpluses.

This had a pronounced effect on copper trading on the London Metal Exchange. Since 1966, LME prices have been the basis on which most transactions outside the United States have been negotiated. The LME price reached a high on April 16, 1970 of £749 per metric ton, the highest price since March 1968. Thereafter it declined more or less steadily to reach a low point of £422 on December 8, 1970, a drop of £327

or roughly 36¢ a pound.

The U.S. price followed a somewhat different course. Most domestic producers had been quoting a price of 52¢ a pound at the end of 1969. This price was revised upward to 56¢ a pound in early January and again to 60¢ a pound at the beginning of April. Despite these advances, the U.S. price remained well below the LME price. The reasons for the discrepancy were investigated in detail by a government panel headed by Dr. Hendrik S. Houthakker of the Presidential Council of Economic Advisers. In April, the panel suggested that the domestic copper industry should consider determining prices through the mechanism of a commodity exchange similar to the LME. The industry has been reluctant to adopt such pricing methods because of the frequency and violence of price changes which, it has been felt, put copper in a disadvantageous position in relation to competitive materials.

For the first time in more than six years, the LME price fell below the U.S. price in August; by October the spread had widened greatly and the domestic price was cut to 56¢ a pound. Subsequently a further drop to 53¢ a pound was posted for the domestic price on December 1, 1970. The swing in domestic producers' quotations during the year therefore amounted to 8¢ a pound, compared with 36¢ per pound on the LME. Early in 1971, a further drop to 50⅜¢ a pound was posted by domestic producers.

Copper deliveries to fabricators in the United States during 1970 fell 7 percent below the 1969 level, a reduction in line with declines reported by the steel and aluminum industries. Outside the United States, in the area reporting to the Copper Institute, deliveries in 1970 were 3 percent less than in 1969.

Stocks of refined copper reported by the Copper Institute rose by 198,000 tons during 1970. Of this increase, 149,000 tons occurred in the last half.

Demand for copper should improve during the first half of 1971 as consumers may decide to replenish inventories as a hedge against a possible interruption in production during the second half of the year, after existing labor contracts expire in the United States. Also, prospects for the building and automobile industries, two major copper consumers, indicate a higher rate of activity on their part than in 1970. Whether this improvement will carry on into the second half of the year will depend in part on the outcome of the labor negotiations and in part on the general level of the economy.

LEAD: Production Up, but Demand Slackens; Prices are Cut

Although demand for lead was at a high level when the year 1970 began, the outlook was drastically altered when the president of General Motors announced in January that his company would thereafter design automobiles to operate on lead-free gasoline in an effort to minimize air pollution from automobile emissions. He declared that effective suppression of emissions required devices not compatible with gasoline containing lead.

Throughout the year this matter was the subject of lively debate, President Nixon, among others, stating that removal of lead from gasoline would be desirable. Although scientific evidence to support this view is scant, a reduction in the use of lead as a gasoline additive appears sufficiently probable so that it has had serious market repercussions.

Gasoline additives accounted for 20 percent of the U.S. lead consumption in 1969. This share did not change appreciably during 1970, but the anticipation that a drastic reduction might occur led consumers generally to sharp reductions in their inventories. The general slowdown in industrial activity accelerated the drop in lead sales. Shipments of refined lead to U.S. consumers in 1970 are estimated to have been about 9 percent lower than in 1969.

At the same time U. S. lead mine production rose due to expansion in the new Missouri mines. Imports of lead, although somewhat less than in 1969, were still substantial. Thus, stocks of refined lead at U. S. plants rose sharply.

This tendency became unmistakable during the second quarter and caused the break in the domestic price in July, when Asarco reduced its sales price from the previous level of 16½¢ a pound to 15½¢ a pound. Unsold inventories continued to mount during the second half of the year. The price was progressively reduced until the year-end when it stood at 13½¢ a pound, New York basis.

A strike at Asarco's Glover Plant and some modest cutbacks in mine production during the second half did not cut into total supplies sufficiently to restore a supply/demand balance.

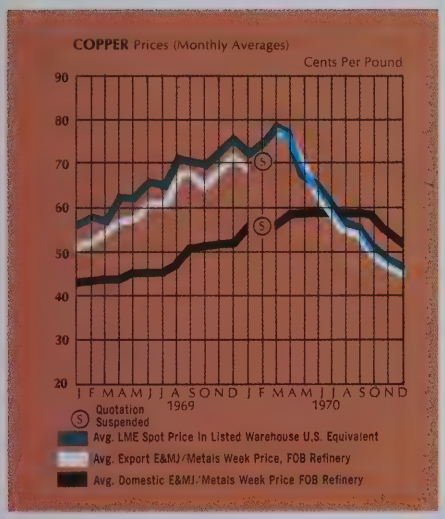
Outside the United States, consumption actually rose modestly. Production was up only slightly so that stocks in the hands of foreign producers increased by only 20 percent during the year, whereas producer stocks in the United States more than tripled.

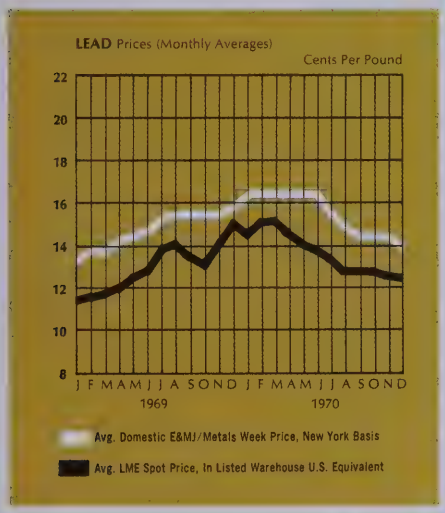
The price on the London Metal Exchange varied between a high of £145 a metric ton on February 19 and a low of £110 on December 31. In view of the sharp drop in the U. S. price, the differential between the two markets narrowed. This was at least partly responsible for the lower level of imports.

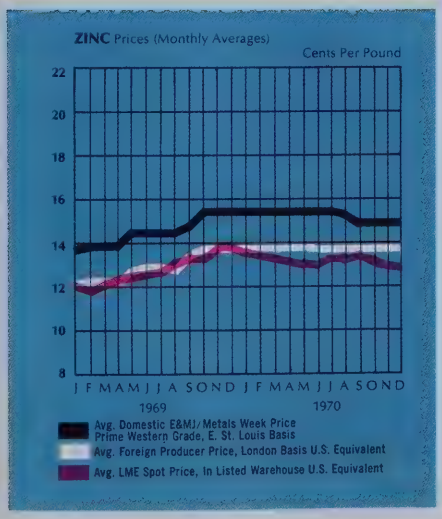
U. S. demand in 1971 will be considerably affected by the extent to which low-lead or no-lead gasoline is bought as a replacement for the lead-bearing gasolines of regular and high-octane ratings which long have been standard in the U. S. market. The anticipated increase in general economic activity during the first half of 1971 may prove something of an offsetting factor to any reduction in demand for gasoline additives, but a substantial over-all improvement in lead demand appears improbable while the controversy over lead in gasoline continues. Efforts to develop new markets in other directions are continuing—notably in the development of electric-powered vehicles, which would use lead batteries, and in architectural applications, such as lead insulation for sound control.

ZINC: Shipments Down 18% as Auto Production Falls

Automobile production in the United States in 1970 fell 20 percent below 1969. As autos are the largest single market for zinc — both in zinc die castings and in galvanized steel — the effect on zinc consumption in 1969 was drastic. Shipments of zinc (including imported metal) to U. S. consumers in 1970 were 18 percent less than in 1969,







the most severe drop experienced by any major metal.

Zinc stocks at producing plants mounted rapidly early in the year, prompting domestic smelters to cut production sharply. The total for the year was 16 percent below the 1969 output. Slab zinc imports also were lower by 16 percent.

Domestic smelters reported stocks of 127,000 tons at December 31 — almost 50,000 tons above stocks held December 31, 1969. As mine production was fairly well maintained, stocks of concentrates on hand at the smelters are believed to have risen somewhat during the year.

The reduction in zinc demand was particularly marked in the case of Special High Grade zinc, used for die castings. In August, the price was reduced from 15½¢ a pound for Prime Western zinc at East St. Louis, Illinois to 15¢ a pound — the only change in published quotations. Wide-spread discounting prevailed, however, in sales of Special High Grade zinc, a grade which normally commands a substantial premium. Early in 1971, a significant change in zinc pricing practices occurred when sellers of Prime Western zinc adopted a delivered price of 15¢ to all destinations, replacing the former East St. Louis basing point plus freight charges up to a maximum of $10 a ton for deliveries elsewhere.

The protracted strike at General Motors plants late in 1970 contributed to the severely reduced level of zinc demand. With widespread forecasts of a higher level of automobile production in 1971, zinc sales may improve this year. Furthermore, the expected stockpiling of steel products by consumers during the first seven months of the year as a hedge against a possible steel strike should tend to increase the demand for zinc of galvanizing grades during that period.

Outside the U. S., zinc consumption was little changed. Although production was up slightly, sellers in the European market made no change in their official producer price quotation of just under 14¢ a pound, CIF (cost, insurance and freight) principal European ports.

On the London Metal Exchange, prices declined moderately but the fluctuations in price were far less marked than in other metals, the high prompt quotation for the year being £128 a metric ton on January 2; the low being £118.75 on May 26.

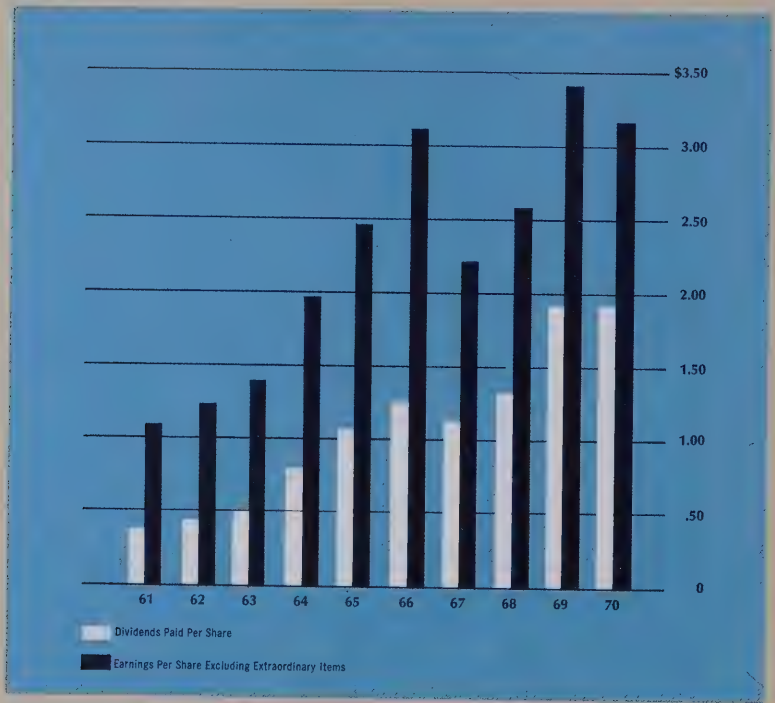
SILVER: U. S. Treasury Sales End; Consumption Down Slightly

The outstanding development in the silver market during 1970 was the termination of the weekly auction sales of silver by the U. S. Government. These sales, intended to liquidate surplus stocks of silver in the hands of the U. S. Treasury, were initiated in August 1968. The last sale was held on November 10, 1970. Up to that date the weekly sales in 1970 averaged 1.5 million ounces. Thus the total sold last year approximated 67 million ounces.

Consumption of silver in 1970 in the Free World is estimated to have been 2 percent less than in 1969, the decline having occurred chiefly in the United States. The lower level of demand was strongly influenced by general economic conditions. As pointed out in previous Annual Reports, speculative activity in silver has been intense in recent years. The sharp drop in the security markets combined with the liquidity crisis created serious problems for some silver speculators and, in at least four instances, firms that had bought silver contracts for future delivery encountered financial difficulties. Enforced liquidation of these positions, combined with the lower level of industrial demand, tended to depress silver prices — contrary to the widely held expectation that prices would rise when government sales ended. The highest price for prompt silver reported during 1970 was $1.93 an ounce at New York on January 29; the lowest price was $1.572 on December 10. The London market followed similar trends.

Free World silver production is increasing only modestly and is still well below the level of Free World demand. Substantial accumulations of silver, both as refined metal and as coin, are available to meet the gap. Because the discrepancy between supply and demand should gradually reduce these accumulations the outlook for a gradual rise in silver prices is believed good.

Earnings Per Share and Dividends Per Share



Stockholders' Equity

Financial Review

EARNINGS AND DIVIDENDS

Net earnings, before extraordinary gains, were $88,803,000, or $3.16 per share compared with $99,394,000, or $3.42 per share in 1969. After extraordinary gains, however, net earnings were $111,718,000, or $3.97 per share compared with $100,808,000, or $3.47 per share in 1969.

Profit margins at domestic smelters and refineries were sharply reduced. Operating costs increased and operations at some plants were periodically curtailed to reduce smoke emissions to meet new environmental standards. Reduced demand for metals resulted in lower sales and increased inventories. Lower realized copper prices and higher taxes reduced earnings from Peru. These factors more than offset higher earnings from Asarco mines in the United States and from Mount Isa Mines in Australia.

An extraordinary gain of $31,545,000, net after taxes, resulted from the sale of 2,028,000 shares of General Cable Corporation stock. This was partially offset by the write-offs involved in the cancellation of the Michiquillay concessions in northern Peru and in the shut-down of the Selby lead plant in California.

Earnings per share are calculated on the basis of average shares outstanding during the year, which for 1970 were 28,156,657. The year-end balance, however, was 26,744,925 shares. There will be an additional benefit to earnings per share coming in 1971 from the reduction in outstanding shares which occurred in 1970.

Dividends of $1.90 per share were paid on the Common Stock during the year, the same as in 1969.

CAPITAL EXPENDITURES

Capital expenditures were $68,723,000, compared with $25,048,000 in 1969. Included in 1970 expenditures was $24,283,000 attributable to the coal mine acquisition from Peabody Coal Company, subject to a reserved production payment obligation of $3 million.

Compared with $38,043,000 at the end of 1969, unexpended property appropriations at the end of 1970 were $17,057,000. Some very substantial additional property appropriations, however, are expected to be required for air-quality control facilities.

EARNINGS BY COUNTRY

The following table sets forth, by country of operations, the consolidated Earnings before U. S. and Foreign Taxes on Income and before Extraordinary Items for the years 1970 and 1969.

	(Millions of Dollars)	
	1970	1969
Australia	$ 30.2	$ 23.7
Canada	4.7	5.0
Mexico	8.7	5.5
Peru	21.0	37.6
United States	51.0	54.9
Other*	(1.2)	(.2)
	$114.4	$126.5

*The losses shown for "Other" primarily are attributable to exploration expenses in countries other than those listed.

Due to the interrelationship between U. S. and foreign income taxes (foreign tax credits), it is not practical to allocate taxes by country. Earnings from Australia, Mexico and Peru are principally equity in earnings of companies approximately 50-percent owned, already reduced by the income taxes imposed in those countries. Taxes still to be deducted will impinge more heavily on earnings in the U. S. and Canada. The most striking changes between 1969 and 1970 were the decline in Peru's contribution from $37.6 million to $21.0 million, and, to a lesser extent, Australia's increase from $23.7 million to $30.2 million.

INVESTMENTS AND CAPITAL TRANSACTIONS

During the year, the Company disposed of all of its holdings of common stock of General Cable Corporation. On July 15, 1970 it sold 2,028,000 shares of General Cable stock to British Insulated Callender's Cables Limited for $24 a share. Thereafter, the balance of its holdings was disposed of pursuant to an offer to its stockholders to exchange 1.35 shares of General Cable stock plus $8.50 cash for each share of Asarco common stock. The offer was oversubscribed, resulting in the allocation of tenders on a pro-rata basis. The Company's disposition of General Cable stock was in accordance with the terms of an antitrust consent decree, to which Asarco is a party, entered on March 15, 1967 and modified on July 24, 1970.

In addition to the 2,078,921 shares of Asarco stock acquired in the General Cable exchange, 151,584 shares were purchased and 40,521 shares were used for employee compensation plans, leaving 26,744,925 shares outstanding at the year end. The Company expects to continue its policy of buying stock from time to time for employee compensation plans and other corporate purposes.

Also, $217,000 par value of the Company's debentures were purchased for $148,000. At the year end, sinking fund obligations amounting to $1,637,000 a year had been covered through 1975.

CURRENT FINANCIAL POSITION

With capital expenditures reaching an all time high, and the acquisition of 2,230,505 shares of common stock, working capital declined by $13,146,000 to $191,713,000. Due to lessened demand for metals in the latter part of the year, production was not completely sold and inventories increased during the year by $42,631,000. These were the principal factors in the $52,139,000 decline in cash and marketable securities to $17,858,000. It is expected that any further cash tie-up in working capital the coming year will be met by commercial bank borrowing.

With its strong balance sheet, the Company is in a position to take advantage of attractive opportunities for profitable investment that become available. It is often in periods of depressed markets for metals and minerals that such opportunities appear.

Consolidated Balance Sheet

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

ASSETS	December 31, 1970	December 31, 1969
Current Assets:		
Cash	$ 12,915,000	$ 12,938,000
Marketable securities (at cost, which approximates market)	4,943,000	57,059,000
Accounts receivable—less reserve	64,403,000	73,821,000
Inventories (note 3)	212,177,000	169,546,000
Materials and supplies	19,284,000	17,399,000
Prepaid expenses	503,000	536,000
Total Current Assets	314,225,000	331,299,000
Miscellaneous Assets	12,910,000	12,191,000
Property (note 4):		
Buildings and equipment	333,589,000	303,035,000
Mineral land	92,268,000	78,374,000
Land, other than mineral	12,666,000	6,814,000
Automobiles	2,018,000	1,965,000
	440,541,000	390,188,000
Less: Depreciation, depletion and amortization	175,203,000	169,899,000
Net Property	265,338,000	220,289,000
Investments in Companies Approximately 50% Owned (on equity basis, note 1)	223,933,000	210,329,000
Investments—Other (at cost or less; note 9 and page 27)	45,652,000	50,466,000
	$862,058,000	$824,574,000

Notes to Financial Statements are on pages 28 and 29.

	December 31, 1970	December 31, 1969
LIABILITIES		
Current Liabilities:		
Bank loans	$ —	$ 2,329,000
Accounts payable	83,993,000	85,199,000
Salaries and wages accrued	4,511,000	4,279,000
Accrued taxes:		
U.S. and foreign taxes on income	19,508,000	19,510,000
Other	6,927,000	7,426,000
Miscellaneous	7,573,000	7,697,000
Total Current Liabilities	122,512,000	126,440,000
Long Term Debt:		
4⅝% Twenty-Five Year Subordinated Debentures, due October 15, 1988 (note 5)	23,736,000	23,953,000
Non-Current Accounts Payable	6,844,000	2,018,000
Deferred Credits (note 4)	29,598,000	28,547,000
Reserves (note 6)	2,806,000	2,871,000
STOCKHOLDERS' EQUITY (notes 7 and 9 and page 27)		
Preferred Stock		
Authorized—10,000,000 shares without par value (none issued)		
Common Stock		
Authorized—40,000,000 shares without par value		
Issued 29,757,144 shares	364,719,000	364,719,000
Earnings Employed in the Business	353,114,000	295,289,000
	717,833,000	660,008,000
Less: Treasury Stock, at cost (1970—3,012,219 shares; 1969—822,235 shares)	41,271,000	19,263,000
Total Stockholders' Equity	676,562,000	640,745,000
	$862,058,000	$824,574,000

Consolidated Statement of Earnings

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

	For the Year Ended December 31, 1970	Per Share*	For the Year Ended December 31, 1969	Per Share*
Sales of Products and Services	$717,836,000		$770,982,000	
Costs of Products and Services—exclusive of items deducted separately below	627,778,000		682,113,000	
	90,058,000		88,869,000	
Equity in Earnings of Companies Approximately 50% Owned (note 1)	58,119,000		63,745,000	
Dividends, Interest and Miscellaneous Income	13,986,000		17,931,000	
	162,163,000		170,545,000	
Deductions:				
Exploration and research expenses	12,578,000		9,363,000	
Selling, administrative and miscellaneous expenses	19,947,000		19,431,000	
Depreciation and depletion	15,223,000		15,236,000	
	47,748,000		44,030,000	
Earnings before U.S. and Foreign Taxes on Income and before Extraordinary Items	114,415,000		126,515,000	
U.S. and Foreign Taxes on Income (note 4)	25,612,000		27,121,000	
Earnings before Extraordinary Items	88,803,000	$3.16	99,394,000	$3.42
Extraordinary Items, net of income tax—1970—$7,627,000; 1969—$710,000	22,915,000	.81	1,414,000	.05
Net Earnings	$111,718,000	$3.97	$100,808,000	$3.47
*Based on average number of shares outstanding	28,156,657		29,058,803	

Extraordinary Items include: 1970—Gain on General Cable stock sold $31,545,000, net of income tax; loss from cancellation of Michiquillay mining concessions, estimated at $4,686,000, net of income tax credit; loss from closing of Selby plant, estimated at $3,944,000, net of income tax credit.
1969—Gain on investment sold $1,414,000, net of income tax.

Notes to Financial Statements are on pages 28 and 29.

Consolidated Statement of Stockholders' Equity

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

(Dollars in thousands)

	1970		1969	
	Shares	Amount	Shares	Amount
Common Stock without par value				
Authorized—40,000,000 shares*				
Issued:				
Beginning of year	29,757,144	$364,719	14,878,572	$364,719
Two-for-one stock split*			14,878,572	
End of year	29,757,144	364,719	29,757,144	364,719
In Treasury:				
Beginning of year	822,235	19,263	323,319	13,482
Two-for-one stock split*			323,319	
Purchased	151,584	4,109	218,900	6,616
Acquired pursuant to exchange offer (note 9)	2,078,921	18,688		
	3,052,740	42,060	865,538	20,098
Used for additional compensation and stock options exercised	40,521	789	43,303	835
End of year	3,012,219	41,271	822,235	19,263
Outstanding end of year	26,744,925	323,448	28,934,909	345,456
Earnings Employed in the Business				
Beginning of year		295,289		235,883
Net earnings		111,718		100,808
		407,007		336,691
Dividends declared 1970—$1.90 per share; 1969—$1.43		53,893		41,402
End of year		353,114		295,289
Total Stockholders' Equity		$676,562		$640,745

On April 28, 1970 the stockholders authorized 10,000,000 shares of preferred stock without par value for issue in such series and on such terms as may be fixed by the Board of Directors.

*At a special meeting on February 11, 1969 stockholders approved an increase in the authorized common stock from 16,000,000 to 40,000,000 shares, and a two-for-one stock split.

Investments — Other

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

DECEMBER 31, 1970

	Owned		Book Value (cost or less)	Market Value*
	Shares or Amount	Percent		
Hecla Mining Company	56,281	.9	$ 807,000	$1,252,000
Kennecott Copper Corporation	105,954	.3	1,134,000	4,172,000
Phelps Dodge Corporation	154,200	.8	5,525,000	5,781,000
Revere Copper and Brass Incorporated:				
Common Stock	1,876,296	33.4	8,511,000	38,699,000
5½% Convertible Subordinated Debentures due 1992	$22,763,000		22,839,000	18,125,000
United Park City Mines Company	549,727	12.5	2,068,000	1,306,000
Miscellaneous			4,768,000	
Total Investments—Other			$45,652,000	

*Based on approximate December 31, 1970 market quotations.

Consolidated Statement of Source and Use of Funds

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

	1970	1969
Cash and marketable securities, beginning of year	$ 69,997,000	$ 63,843,000
Source of Funds:		
Net earnings	111,718,000	100,808,000
Depreciation and depletion	15,223,000	15,236,000
Deferred income taxes	693,000	3,323,000
Losses on properties	11,912,000	338,000
Excess of equity in earnings of companies approximately 50% owned, over dividends received	(12,974,000)	(15,651,000)
	126,572,000	104,054,000
Investments—sales and other disposals	4,184,000	756,000
Decrease in accounts receivable	9,418,000	4,421,000
Increase (decrease) in accounts payable and accrued taxes	(1,707,000)	17,799,000
	138,467,000	127,030,000
Use of Funds:		
Property expenditures	71,719,000	25,048,000
Reduction of long-term debt	217,000	9,530,000
Cash dividends—declared in current year	53,893,000	41,402,000
—declared in 1968		13,827,000
Treasury stock—purchases, net of dispositions	3,320,000	5,781,000
—acquired pursuant to exchange offer (note 9)	18,688,000	
Increase in inventories	42,631,000	21,979,000
Other, net	138,000	3,309,000
	190,606,000	120,876,000
Cash and marketable securities, end of year	$ 17,858,000	$ 69,997,000

Notes to Financial Statements

1. Principles of Consolidation

The consolidated statements include all subsidiaries 100% owned. Principal operations are in the United States, but other important operations are in Canada and Peru.

Current assets and liabilities of foreign branches and consolidated subsidiaries have been adjusted to current rates of exchange and the resulting gain or loss reflected in earnings. Property accounts are reflected at historical U.S. currency acquisition cost.

Investments in companies approximately 50% owned (M.I.M. Holdings Limited, formerly Mount Isa Mines Limited, Southern Peru Copper Corporation, Asarco Mexicana, S.A., and three minor companies) are carried at cost plus equity in undistributed earnings since acquisition.

2. Acquisition of Coal Properties

On November 23, 1970 the Company acquired the properties of four producing coal mines from Peabody Coal Company, a subsidiary of Kennecott Copper Corporation, for $24,283,000 in cash and a reserved production payment obligation of $3,000,000.

3. Inventories

Inventories of smelters, refineries and secondary metals plants include $118,262,000 (1969—$72,915,000) at last-in first-out cost, reflecting some unearned profits of indeterminable amount, $39,180,000 (1969—$32,782,000) at provisional cost of metals purchased for which prices had not yet been fixed, and $36,267,000 (1969—$45,977,000) at sales prices for metals sold under firm contracts for future delivery. Inventories of mines aggregate $11,203,000 (1969—$6,348,000) at first-in first-out cost. Inventory values do not exceed market.

4. Property and Deferred Credits

Fixed assets are stated at cost or less. At smelters and refineries, depreciation applicable to property acquired since January 1, 1961 is computed by accelerated methods based upon estimated lives of the property units; depreciation applicable to property units acquired prior to 1961 is computed on a composite rate. At secondary metals plants depreciation generally is computed on the straight line method. At mines, depreciation and depletion generally are computed on an ore reserve basis.

The tax benefit of $29,024,000 (1969—$27,593,000), resulting primarily from allowable deductions taken in income tax returns for depreciation and mine development in excess of the amounts charged against earnings in the ac-

counts, has been deferred. The amount deferred is included in the caption Deferred Credits on the balance sheet, and will be transferred to earnings in later years when the related depreciation and mine development will not be deductible for income tax purposes.

Deferred taxes included in the 1970 provision for U.S. and Foreign Taxes on Income and in Extraordinary Items amounted to $693,000 (1969—$3,323,000).

5. 4⅝% Twenty-Five Year Subordinated Debentures, Due October 15, 1988

Sinking Fund payments of $1,637,304 are required annually on October 14. Debentures have been purchased covering payments through 1975.

6. Reserves

The Additional Compensation Reserve has a balance of $2,372,000 (1969—$2,400,000). In the year 1970 $3,351,000 (1969—$3,802,000) was appropriated to the reserve from earnings, $320,000 (1969—$190,000 in cash) was paid in cash and restricted common stock to officers and major executives, and $3,059,000 (1969—$3,167,000) was allotted in cash and common stock to other eligible employees.

7. Stock Options

A qualified stock option plan was approved by stockholders in 1967. Options are granted at fair market value on date of grant and may be exercised any time within five years of grant. All options exercised during the year and options outstanding at year-end were at prices ranging from $25.85 to $28.94 per share.

	Number of Shares		
	Authorized	Granted	Exercised
Balance at beginning of year	800,000	321,688	61,700
Transactions in 1970	—	2,414*	11,039
Balance at end of year	800,000	319,274	72,739

*Lapsed

8. Retirement Plans

The Company's retirement plans cover substantially all employees. Normal retirement age is 65 but the plans provide for earlier retirement under stipulated conditions. Unfunded prior service costs were approximately $34,910,000 which amount is being funded and charged to earnings over a period of 25 years. The charge to earnings in 1970 for both current and prior service costs was $6,760,000 (1969—$6,055,000). The actuarially computed value of vested benefits at the latest valuation date exceeded the total of the retirement funds by $15,430,000.

9. Disposition of General Cable Corporation Common Stock and Acquisition of Company's Common Stock

On July 15, 1970 the Company sold 2,028,000 shares of General Cable stock for $24 a share. Thereafter, the Company disposed of the balance of its holdings pursuant to an offer to its stockholders to exchange 1.35 shares of General Cable stock plus $8.50 cash for each share of Asarco common stock. The Company thereby acquired 2,078,921 shares of its own stock. The disposition of General Cable stock was pursuant to the terms of an antitrust consent decree, to which Asarco is a party.

10. Litigation

The Company is a defendant in various lawsuits. Refer to Litigation on page 16 for further details.

It is the opinion of the Company and of its counsel that the outcome of the lawsuits and of other miscellaneous matters now pending will not materially affect the operations or the financial position of the Company or of any of its subsidiaries.

Auditors' Report

To the Board of Directors of
American Smelting and Refining Company:

We have examined the consolidated balance sheet of American Smelting and Refining Company and Consolidated Subsidiaries as of December 31, 1970, and the related consolidated statements of earnings, stockholders' equity and source and use of funds for the year then ended. Our examination was made in accordance with generally accepted auditing standards, and accordingly included such tests of the accounting records and such other auditing procedures as we considered necessary in the circumstances. We previously examined and reported upon the consolidated financial statements of the Company for 1969.

In our opinion, the consolidated financial statements mentioned above present fairly the financial position of American Smelting and Refining Company and Consolidated Subsidiaries at December 31, 1970 and 1969, and the results of their operations and the source and use of funds for the years then ended, in conformity with generally accepted accounting principles applied on a consistent basis.

LYBRAND, ROSS BROS. & MONTGOMERY

New York, February 22, 1971

Ten-Year Financial Summary

AMERICAN SMELTING AND REFINING COMPANY AND CONSOLIDATED SUBSIDIARIES

(Dollars In Thousands)	1970	1969
Earnings		
Net Earnings	$111,718	$100,808
Extraordinary Items, net of income tax, included above	22,915	1,414
Return on Common Stockholders' Equity	16.5%	15.7%
Depreciation and Depletion	15,223	15,236
Common Stock		
Common Stockholders' Equity	$676,562	$640,745
Cash Dividends*	53,893	55,224
Per Share:**		
Net Earnings***	3.97	3.47
Extraordinary Items, net of income tax, included above	.81	.05
Cash Dividends	1.90	1.90
Book Value	25.30	22.14
Shares Outstanding**	26,744,925	28,934,909
Number of Stockholders	50,900	38,300
Financial Position		
Total Assets	$862,058	$824,574
Working Capital	191,713	204,859
Capital Expenditures in year	68,723	25,048
Long Term Debt	23,736	23,953

*Dividends paid on preferred stock, 1961 and 1962—$3,500,000 each year; 1963—$2,625,000.
**Adjusted to reflect two-for-one stock split in May 1964, 33 1/3% stock dividend in June 1968 and two-for-one stock split in February 1969. Shares outstanding are as of end of each year.
***Based on average number of shares outstanding each year.

1968	1967	1966	1965	1964	1963	1962	1961
$ 78,617	$ 71,284	$ 90,159	$ 75,522	$ 61,124	$ 42,633	$ 39,397	$ 35,193
5,389	7,509	980	3,741	3,033	—	—	—
13.4%	12.7%	17.3%	16.1%	14.0%	10.1%	8.9%	8.3%
12,894	10,594	11,021	11,531	13,535	13,340	13,687	12,166
$587,120	$560,217	$522,237	$468,797	$435,380	$395,306	$404,995	$381,306
38,163	32,709	36,058	30,789	23,295	14,848	12,562	10,902
2.70	2.45	3.10	2.59	2.06	1.36	1.23	1.09
.18	.26	.04	.13	.10	—	—	—
1.31	1.12	1.24	1.05	.79	.50	.43	.37
20.17	19.26	17.94	16.09	14.68	13.42	13.90	13.10
9,110,506	29,085,848	29,110,173	29,136,229	29,664,491	29,453,237	29,141,824	29,102,464
27,400	27,300	25,300	22,800	22,050	21,650	22,450	23,180
$771,673	$698,618	$674,638	$617,015	$575,418	$522,268	$538,490	$511,089
185,859	186,710	213,529	191,670	186,152	165,110	180,205	153,932
37,204	46,742	36,207	10,949	11,416	7,266	7,916	14,780
33,482	35,198	36,421	40,000	40,933	40,933	—	—

Directors

E. McL. Tittmann*	*Chairman of the Board and Chairman of the Executive Committee*
Charles F. Barber*	*President*
R. L. Hennebach*	*Executive Vice President*
F. W. Archibald	*Vice President; Chairman of the Board, Southern Peru Copper Corporation*
William R. Bond	*Executive Vice President, The Mead Corporation*
Fletcher L. Byrom	*Chairman of the Board, Koppers Company, Inc.*
George Champion*	*Director, The Chase Manhattan Bank, N.A.*
Cris Dobbins	*Chairman of the Board, Ideal Basic Industries, Inc.*
Forrest G. Hamrick*	*Vice President*
John M. Kingsley*	*Director, Bessemer Securities Corporation*
Robert Macfarlane*	*Chairman Emeritus and Director, Burlington Northern, Inc.*
R. E. McNeill, Jr.*	*Director, Manufacturers Hanover Trust Company*
C. E. Nelson	*Vice President*
Dale E. Sharp	*Director, Morgan Guaranty Trust Company of New York*
Hans Stauffer	*Chairman of the Finance Committee, Stauffer Chemical Company*
Simon D. Strauss*	*Vice President*

**Member of Executive Committee*

General Officers

E. McL. Tittmann	*Chairman of the Board*
Charles F. Barber	*President*
R. L. Hennebach	*Executive Vice President*
F. W. Archibald	*Vice President*
Forrest G. Hamrick	*Vice President (Finance)*
J Paul Harrison*	*Vice President (Purchasing)*
A. L. Hatch†	*Vice President (Ore Purchasing)*
K. D. Loughridge	*Vice President (Smelting and Refining)*
R. A. Kenkel	*Vice President (Federated Metals Division)*
Frank L. Merwin	*Vice President (Traffic)*
C. E. Nelson	*Vice President (Mining)*
C. P. Pollock	*Vice President (Exploration)*
Douglas Soutar	*Vice President (Industrial Relations and Personnel)*
Simon D. Strauss	*Vice President (Sales)*
H. Q. Stringham	*Comptroller*
A. J. Gillespie, Jr.	*Secretary and General Counsel*
R. J. Plumb, Jr.	*Treasurer*
H. E. Kelshaw, Jr.	*General Auditor*

**Retired, December 31, 1970*
†Deceased, March 3, 1970

Asarco Products

MINING, SMELTING AND REFINING

Antimonial Lead
Antimony
Antimony Oxide
Arsenic Trioxide
Bismuth
Cadmium
Cadmium Oxide
Cadmium Sulfide
Calcium Lead
Copper
Ferro-Selenium
Ferro-Tellurium
Gold
High-purity Elements
Ilmenite
Indium
Indium Salts
Lead
Litharge
Molybdenum Concentrates
Nickel Selenium
Nickel Sulfate (crude)
Palladium (crude)
Platinum (crude)
Selenium
Silver
Slag
Sulfuric Acid
Sulfur Dioxide
Tellurium
Test Lead
Thallium
Thallium Salts
Zinc
Zinc Alloys
Zinc Sulfate

MIDLAND COAL COMPANY

Coal

LAKE ASBESTOS OF QUEBEC

Asbestos Fibre

FEDERATED METALS

Acoustilead (for sound control)
Aluminum Alloys
Anodes (for cathodic protection) Aluminum, Magnesium, Zinc
Anodes (for electroplating) Brass, Cadmium, Copper, Lead, Silver, Tin, Zinc
AsarcoLo Fusible Alloys
Babbitt Metals
Bearing Alloys
Bismuth Alloys
Brass Ingot
Brazing Alloys
Brighteners (for electroplating)
Bronze Continuous-Cast Shapes
Bronze Ingot
Cadmium Alloys
Caulking Lead
Copper Anodes (cast, electro-deposited, rolled)
Copper Shot
Counterelectrode Alloys
Deoxidizers (metallic)
Die Casting Alloys
Lead Products (sheet, pipe, fittings, construction)
Magnesium Alloys
Magnesium Anodes
Nickel Alloys
Nickel Salts (for electroplating)
Nuclear Shielding Lead
Phosphor Copper
Solder (extruded, drawn and cast)
Tin (pig, bar, ingot, wire, ribbon)
Type Metals
Zinc Anodes
Zinc Die Casting Alloys
Zinc Dust

ENTHONE

Automatic Plating Equipment
Blackening Compounds
Buffing Compounds
Corrosion Inhibitors
Derusting Salts
Electroless Plating Processes
Metal Strippers
Plating Brighteners
Specialty Chemicals (for metal finishing)
Surface Conditioning Compounds

IONIC INTERNATIONAL

Automatic Plating Equipment